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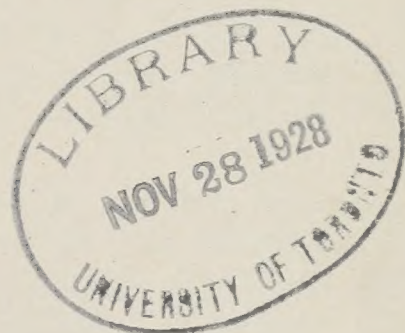
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The Training and Pruning of Fruit Trees



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TRAINING AND PRUNING OF FRUIT TREES

In general there are two chief ends in view when a man begins to prune a fruit tree; he wishes to shape it or to make it produce in accordance with some definite idea. A knowledge of the science and experience in the art of pruning are almost essential to a satisfactory attainment of the desired objects. Conditions and personal opinions are at such variance that this bulletin will concern itself chiefly with principles that underlie pruning practises.

In every tree there is a continual struggle for life and existence between its different parts. Twigs are fighting twigs, and branches are vying with branches for light and food. Those which have some advantage, generally of position, crowd and repress the others until they become dead or of little use. This is simply the work of nature, and the result is far from desirable from the viewpoint of the fruit grower. Neither the shape assumed nor the fruit produced is conducive to economy or profit. Such a condition is however inevitable in the unpruned tree or orchard.

Fruit trees should be pruned, but the work should be based upon proper principles. Poor pruning may be as disastrous as no pruning; it may fail just as completely in attaining a sought-for end. Correct practises in pruning are fundamental to the welfare and worth of a fruit tree.

If people would keep in mind and understand the fact that when they cut trees they are not only changing the shape but also affecting the production, there might be more good pruning and less poor pruning done. Trees are sometimes modified in shape with no consideration whatever of the effect upon their bearing habit. Pruning is one of the very interesting operations in the orchard because it gives a man an opportunity to use his judgment in all cases. An orchardist or farmer, to prune successfully, must know something about the fruiting habit of the tree, give attention to its age and shape, consider the possibility of a crop and its size, and understand the effects of pruning and something about the methods to be followed in gaining a desired condition. Fruit trees are *trained* to give them shape and *pruned* to influence their production. Some cuts are designed to do the former, some the latter, and some to help in both ways, but in aiming at one, the other must never be lost sight of. The two are closely connected and must be considered together.

All the illustrations in this bulletin, except those on pages 6 and 16, were furnished by the Ohio Agricultural Experiment Station.

THE IDEAL TREE

It is impossible to describe the ideal fruit tree because ideals differ with the conditions present. These conditions include the kind of fruit, the natural growth tendency of the tree, the section of the country in which it may be located, the site of the orchard, the prevailing pests, the market to be supplied, and the individual ideas of the grower. Therefore, there are many ideals, most of which are probably excellent for their particular environments. In general, the ideal tree is one that is healthy and strongly built, that allows of economical management, and that is satisfactorily productive.

For the man who is intending to develop an orchard, one of the important factors for success, is in having an ideal and in following it consistently and with judgment. It is entirely essential to best results that a system of pruning once begun with a young tree be followed, or the whole object may be lost. Without an ideal this is impossible. In mature trees, a change of system is quite likely to cause a great enough disturbance in the tree's equilibrium to allow it to slip into a condition of unproductiveness for a number of years. Ideals should not give way on every occasion to fads and fancies.

A man with an ideal in mind can train a young tree with more or less foresight and decision. He knows what he wants the tree to look like when it becomes older and he can build it into that shape as it grows. He has something definite from the beginning to work toward. The ideal in case of the orchardist takes the place of the architect's plans used by the house builder.

Upon approaching a mature tree with the intent of pruning it, a man with a well defined ideal is able to see exactly what changes he will be required to make in order to bring the tree into a conformation and general appearance as near like that ideal as may be possible in the case of that particular tree. If it is too high for his ideal, he can cut it back; if too thick, he can open it up; if too close, he can spread it out; if too bushy, he can thin it. Whatever the condition may be, the man with an ideal has a mental picture of what he considers the best grown tree for its kind and he will strive to produce it. To use further the illustration in the above paragraph, the pruner is like the carpenter who alters and remodels an old house into a new one, sometimes of far different aspect, in accordance with plans already conceived and drawn up.

TRAINING THE TREE

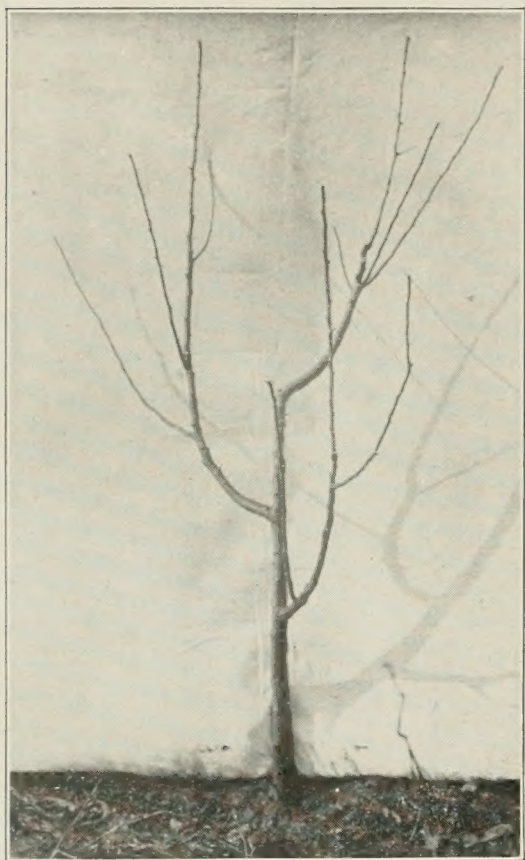
The training of a tree like that of a child should begin early. A decision regarding the height of the head, the number of scaffold limbs and the pruning system to be followed must be made as soon as the tree is set. Its future shape and value are determined largely by the training it received in its earlier years. As the tree grows older the training will give way more or less to pruning designed to influence production, though even the mature tree requires a certain amount of corrective and directive cutting.

The Low Head.—There is now not much controversy over the matter of high and low heads in fruit trees. A tree in which the main branches leave the trunk at a height of less than about 4 feet may be considered a low headed one. With the coming of keener competition, of the necessity of spraying for the control of insects and diseases, of more pruning, thinning, hand picking and such practises, indispensable to quality fruit, the advocates of the low heads have many indisputable arguments to offer favoring low heads. Briefly the advantages of the low headed trees are: (1) greater economy in pruning, spraying, thinning, and picking; (2) more thoroughness in spraying; (3) less damage to tree and fruit from winds; (4) less injury from sun scald; and (5) better conservation of the soil moisture due to more shading. The chief objection to the plan is that it becomes impossible to work the ground under the tree when it becomes old. With most growers this is no argument at all, as they do not attempt to get close to the trunk of the tree with their cultivators. The greater portion of the feeding roots of the tree are at some distance from the crown, and the cultivation should be over them. If desired, the soil under the tree may be mulched. With few exceptions the low headed tree is the preferable one.

Forming the Head.—If a tree is expected to be a strong one, capable of holding up without breaking under the strain of a load of fruit, it must be built properly at its head. Too often, no thought is given to this matter. The pruner forgets that the limbs are going to be larger in later years and that they must have sufficient space in which to grow.

In the first place, it must be understood that the trunk of a tree does not increase in length; or, in other words, when the head is formed at a certain height from the ground, it will always remain at that height. The distance between the lowest limb and the upmost one will never become greater. The fact can be appreciated, then, that if this distance happens to be but a few inches and a number of

branches are growing from the trunk within it, these branches as they grow larger in diameter are going to crowd each other. At least, they in later years will all leave the trunk at practically the same point. If they become crowded, some or all of them will be weakened through lack of space in which to grow; if they all proceed from the same place on the trunk, the entire weight of the top will be centered there and a great strain at that point results. These conditions are often the cause



Showing distribution of main and secondary scaffold branches on 2 yr. old apple. In actual work, more wood should remain, but must be kept suppressed.

for the breaking of limbs at their origin. It means that a large part of the tree is lost for fruit bearing purposes, the tree's symmetry is destroyed and, a large uneven wound is formed which will heal with difficulty and sometimes not at all.

In order to make the tree strong where it should be strong, ample room must be given each limb to develop unhampered, and the weight should be distributed over a considerable length of trunk. Care should be taken also to see that these limbs do not form sharp, or acute crotches with the trunk. Besides being well distributed up and down the trunk, these main limbs should be chosen so that they will divide the space around the tree into approximately equal parts.

Shaping the Top.—Not all men prefer the same kind of a top in

their fruit trees. In Ohio, the two important styles are the open-centered and the two-storied. The former is also spoken of as the vase shape and the single head. The two-storied, or double-headed tree is used more especially with the apple and pear. The use of the two-storied apple tree is confined principally to the southern hill sections of the state.

In building the open-centered tree, it is headed at the desired height and chosen lateral branches are developed into the main scaffold limbs. In the two-storied tree, a continuation of the trunk is allowed to grow above the first set of scaffold limbs for a short distance, at

which point it is headed again and another group of limbs is started.

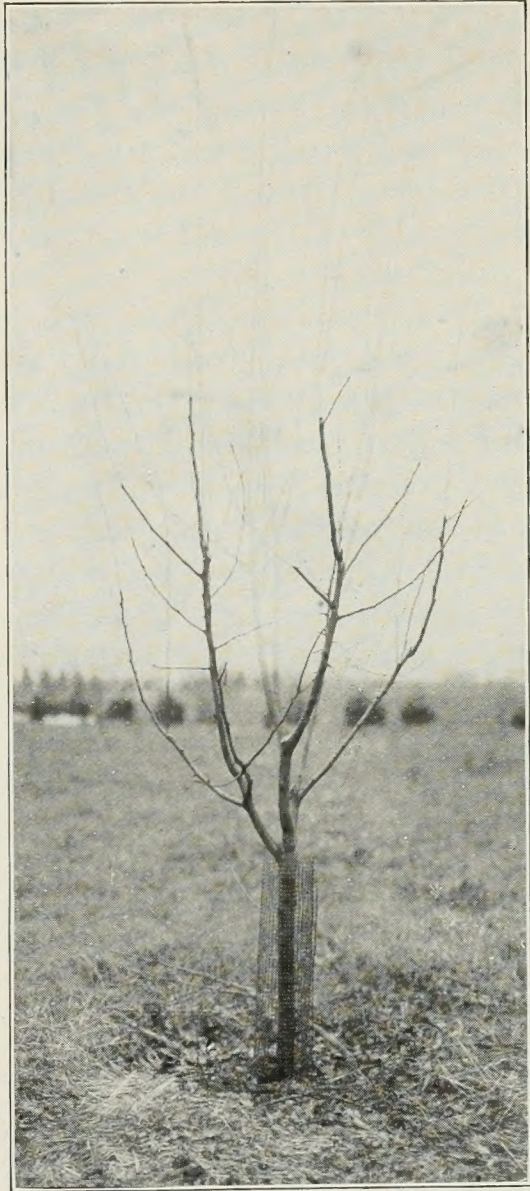
Some men train their trees so that they will assume a globular shape; others prefer a flat top, which seems to be increasing in favor among growers of all kinds of common fruits. It tends to spread the tree out and to keep it low.

Severe pruning is practised by many, while others are more conservative. It is certain in the case of apples, at least, that many trees have been overpruned.

Fruit Bud Formation.—On our fruit trees there are two kinds of buds; leaf, or branch buds and flower, or fruit buds. The concern of the grower is chiefly with the latter. Although the fruit bud is the forerunner of fruit, many men in their pruning do not take into consideration their presence or the effect that the operation may have upon them. No one can be a good pruner who does not know the bearing habit of the various kinds of fruit trees and appreciate the principles underlying their formation.

A tree in which there is not a fair supply of food in the branches and twigs will not ordinarily set many fruit buds. This lack of food material may result from too rapid growth on the part of the tree or because enough food is not furnished to the tree. These two points are important and should be borne in mind by the pruner, because he can, to a large extent, influence the action of the tree one way or the other. Pruning is not the only practise that will affect the formation of fruit buds but it is one of them.

When a tree is growing rapidly, it is producing much wood and



Light lines show wood removed from apple in which too many branches had been left previously. Dark portion shows what was left.

many leaves. In the production of this wood and these leaves, it is using up large quantities of plant food. As long as it uses this plant food for wood and leaves, there is none left to be stored up in the branches and twigs and, therefore, none to produce fruit buds. If a man, through lack of knowledge or over-enthusiasm, prunes a tree so severely that it is forced into a strong, sappy, watersprouty growth he will usually find that he has thrown it out of balance with the result that it may fail to bear well for the next several years. It is possible also to keep a young tree pruned so hard that the continual production of the extra vigorous twigs causes a delay in the beginning of the bearing age. Too rapid wood growth is antagonistic to the formation of fruit buds.

Too vigorous growth can sometimes be corrected by pruning. If the twigs and watersprouts which are developing fastest can be removed in the summer, those parts which are using up the tree's food will be taken away and the remaining food may be directed into other slower growing twigs and into fruit buds and spurs. Summer pruning cannot however be recommended as a general practise.

Some trees do not get enough food to make enough growth. In such cases, proper pruning among other things may be of great assistance in stimulating the formation of flower buds. By the removal of a more or less large amount of wood in limbs, that which remains receives an extra supply of food and as a result a thriftier condition is inaugurated and often a good crop follows.

Another condition that is affected by pruning and which is essential to the production of fruit buds is light. Leaves are unable to manufacture food for the tree without sunlight. A leaf which does not work soon drops. Without the presence of leaves there will be no development of buds of any kind. Therefore, it follows that if a man desires buds, he must have healthy, working leaves, and as these leaves need light in order to function, it is essential that the tree be opened and thinned out enough to allow the light to enter. The sorry condition in many orchards in Ohio is caused in a majority of cases by the lack of light.

In brief, the tree which is enjoying a normal, healthy, fairly thrifty, even, uniform growth is likely to be the tree that bears good and regular crops. The pruning, in connection with the other orchard operations, that can induce and maintain this regular normal growth and allow of sufficient light is the ideal kind, no matter which system is being followed.

PRUNING OF FRUIT TREES

PRUNING THE APPLE

There is probably a greater divergency of opinion and practise in the pruning of an apple tree than that of any other fruit. This difference begins when the tree is first set out.

Heading the Tree.—The tendency has been in the past dozen years to grow extremely low-headed apple trees. Men have cut their trees down to 18 inches and less. However, in more recent plantings, the tendency has been to shorten the trees to from 30 to 50 inches, depending chiefly upon whether the tree is an upright grower or a spreading one. The big objection to the 18-inch tree is that it is impossible to give the scaffold branches ample room in which to develop. They will proceed usually from the four or five buds nearest the point of heading and a crowded condition cannot help but result. When the tree is headed at 40 inches, for example, there is sufficient trunk from there down to 18 or 20 inches upon which to build a framework in which the limbs are properly separated. In a tree that grows as large and which bears as heavy crops as does the apple, a strong head is important.

Training the Young Tree.—If a one-year-old tree is planted, the only cutting done is to head it at the desired height. The leaves which develop along the trunk should be allowed to remain because they help to elaborate the raw sap and to shade the young trunk. If a branch that obviously will not be used in forming the framework of the tree begins to grow too rapidly and long, it should be headed back, but with that exception the usual rule is to allow the tree to develop to its utmost during the first summer. If it has vigorous growth it will produce enough good branches from which to select suitable main limbs.

Before the beginning of the second year's growth, or, if a two-year-old tree is planted, before it leafs out, the main scaffold limbs are chosen. From three to five is the usual number. Growers are learning that too many large limbs tend to crowd the tree, compelling more pruning in later years and increasing the cost of production and of harvesting. Fewer scaffold limbs will have an opportunity to obtain more food and thus grow large and strong. These scaffold limbs should be chosen, having in mind not only the fact that they should be well distributed as regards space up and down the trunk, but also that they should divide the space around the tree approximately evenly.

These branches on which the tree's framework is to be built are then cut back, depending upon their growth, to an outside bud, as a rule, located at from 10 to 20 inches from the trunk. During the tree's second summer, it is allowed to grow as it will with the exception that twigs which seem to be over growing at the expense of others should be checked.

Before the third year begins, the laterals which have pushed out from the scaffold limbs left the previous season, will have to be thinned



This type of tree needs to have twiggy growth reduced and a slight heading in at top.

out and shortened to 12 or 15 inches. Two or three of these laterals are retained and they should be selected for direction and proper spacing as in the case of the primary, or scaffold limbs.

This system is followed in general until the tree comes into bearing. After that the heading-in process is ceased unless growth in certain twigs becomes too vigorous. There has been a feeling in past years that young trees should be pruned very severely, the idea being that all wood that was not absolutely needed should be removed. The tendency however to do less cutting is becoming apparent and the practise is to leave all wood that should not for some good reason be taken out. The more leaves the young trees have the more food they can make and the more vigor and strength the tree will have. Light pruning will, in most cases, allow earlier bearing than will heavy prun-

ing. So, unless a branch or a twig is running away from the others or is crowding and seriously interfering with their growth it may be left in. Even wood that will have to be removed later may be allowed to remain wholly or partly on the tree for several years.

If the tree is a variety that has an upright habit every effort should be made to direct the growth outward by favoring those laterals which are most nearly horizontal and by heading in more severely those which point upward. The tendency cannot be entirely changed of course, but it may be more or less corrected. If the tree is a sprawly one, it may be necessary to train it up rather than out.



The tree shown on page 10 pruned.

Pruning of Mature Trees.—The problem in pruning a mature tree is to keep it low and spreading by annual heading-in of the growths that tend to go too high, to free the tree of dead and badly insect infested and diseased wood, to maintain a fair amount of bearing wood throughout the whole tree, and to keep the smaller twigs and branches well thinned out. By keeping the top low, the fruit is grown and harvested with greater ease and economy. By spreading it out, more well colored apples can be produced because there is greater space exposed to the sunlight. Unless the brush is thinned out and the tree opened up, the death of the inside and lower fruiting wood will follow. Fruit buds need light in abundance in order to form and to continue

their work and existence. A tree that is thick with twigs will be full of wood that is barren of buds of any kind. Such wood is of no use and is in fact a detriment to the tree. In taking out the thickly growing and crowded branches and twigs which are crossing or interfering with others, the pruner should cut out those branches which show a lack of healthy buds. In a tree that has gone for some time without pruning, plenty of this fruitless, barren wood can be found. The ones that show the most buds and spurs should be left.



Old tree in need of pruning.

Renovation of Old Apple Trees.—The run down orchard is a common sight in Ohio. The causes inducing this condition include old age, insects and disease, starvation, and a lack of pruning. The last named can be blamed for a considerable amount of the trouble. It must not be expected that every old apple orchard can be renovated profitably, but there are many that can. There are other steps that must be taken in rejuvenating orchards but pruning is one of the very important ones. In misused trees there is usually an abundance of dead wood, large and small, and it should be removed. Weak, diseased wood should also be cut out.

Another common condition found in trees in need of renovation is a great height. High trees are difficult to spray and to pick the fruit from and the cost of management is great. An effort should be made



Same tree shown on previous page headed back and thinned out.



Same tree in leaf the following summer.

therefore to correct this fault. However, if a tree is extremely high with the fruiting surface so located that in order to reduce the tree to a workable height, this surface would have to be cut almost entirely away, it is a question whether much renovation is practical. The owner will have to make the best of a bad job and do what he can without greatly lowering the tree or else cut it down. The actual condition of the tree will determine the course to be taken. When the build of the tree allows of a heading back and yet of the retention of a considerable amount of bearing wood, the work is not complicated or difficult.

Those branches which point upward and which are carrying the tree beyond the desired height should be cut away immediately above a branch which is more horizontal in its growth. Generally the direction of this growth will be outward in order to spread the top but not always, as sufficient foliage must be retained in the center of the tree to protect it from the sun and to allow production of fruit there as well as on the outside.

In renovation, the pruner has two dangers to consider. First, he may cut too much from his tree in an effort to give it an open center, and second, he may, through over-enthusiasm or lack of experience, be too severe in his work throughout the tree. A tree should have an open center, but that does not mean that it should be shaped like a bowl. A tree without small wood in the center fails to bear as much as it might and is apt to suffer from sunscald. Too severe cutting results in a large growth of watersprouts, injury from sunscald, and a probability of lessening fruit production for several years. Too rapid wood growth militates against fruit production. Over pruning may result in an extremely poor condition in the tree. For this reason, it may be wise where much wood is to be removed, to extend the work over two years at least, instead of cutting out all of it at one time. Heavy pruning should be done in years of expected large crops rather than before light ones. If a crop is present and has to be matured the tree uses up much of its food in that work and there is not such a rampant growth of wood.

Watersprouts generally follow any severe pruning. They are the result of an attempt by nature to bring back a balance between the roots and the top. If they serve some such purpose as shading certain newly exposed parts of the tree or are growing in such a place that they can be trained to fill up some unnecessarily open space, they should be left. If they are simply using up plant food in the making of wood which will be useless or which tends to crowd other wood, they should be removed, in summer if possible, in winter otherwise. Those

that are left can be directed better and will set fruit buds earlier if they are headed back before they have grown too long.

Large wounds heal more slowly than small wounds and very large wounds may never heal over. Wounds of a half dozen or more inches, especially in old trees, scarcely ever heal. Large wounds may often be avoided and the same ends be achieved by going a little farther along and making two or three small wounds instead of the one large one. For instance, two or three or four or more wounds two inches across will heal over long before one wound six inches wide will.



Keiffer pear before pruning.



Same tree after pruning.

PRUNING THE PEAR

The same system, as explained for the apple, is used in training young pear trees. From four to six main branches are employed in building the tree. If the trees have a tendency toward extreme upright growth, it may be more difficult to spread them out. However, a constant heading-in of the upward growing shoots, cutting to outside buds and outward-pointing laterals will do as much as can be done to open up the tree.

As the pear is less twiggy in its growth and there is less desire for sunlight for the purpose of coloring the fruit, less thinning has to be done. In bearing trees, the branches which are growing too high and especially those in the center will have to be cut back continually to laterals. The outer branches, especially in such varieties as the Kieffer, tend to bend over and to open up the tree due to the weight

of the fruit carried. Severe pruning of the pear should not be attempted except in unusual circumstances as the sappy growth induced is very subject to the blight disease.

PRUNING THE PEACH

Young Trees.—As a rule, the peach is headed lower than the apple or pear. The first branch is brought out at a height of from 12 to 20 inches. About six scaffold branches are grown and although some space should be left between them, it is not as essential that it be great because the tree is smaller and lives fewer years than the apple and pear.

One-year-old trees are preferred for planting. If these have plenty of good buds left along the stalk and below the point of heading, any branches which may have developed in the nursery row are cut off. If however, nearly all the buds have developed into branches during the first year, these branches are cut back only to stubs. Everything beyond the first vigorous outside bud is cut away.

The young peach tree will branch abundantly. Some of these branches will have to be thinned out during the winter though several are generally left on each previous season's growth. The twigs are also clipped back about a third of their length. The pruning of the young peach is different from that of the apple and pear in that there is more wood growth and more has to be cut away and the tree is trained to a decidedly open center.

Mature Trees.—The pruning of the mature peach tree is not unlike that of the young tree. However, the cutting is determined more by the number and position of the fruit buds than by the mere position of the twigs.

The peach bears its fruit from lateral buds on one-year-old wood. These buds are easily recognized. Buds are found on the one-year-old wood singly, in pairs, or in threes. When in pairs one is a fruit bud and one a leaf bud, when in threes, the outside ones are fruit buds and the middle narrow one is a leaf bud. The fruit bud is larger and plumper.

The peach is pruned harder than any of the other common tree fruits, for several reasons. As the tree bears only on one-year-old wood, unless it is severely headed-in, the fruit in a few years will be found high in the air or out near the ends of long willowy branches. Wood of the previous summer, unless it shows the presence of fruit buds, may be taken off, because, if it does not bear during its second year, it never will. Pruning is the cheapest way of thinning the fruit.

Peaches often overbear if allowed to. By heading-in and thinning out the wood, the fruit can be thinned early and cheaply. Twigs which are well filled with fruit buds may be shortened a third or even a half, those that have buds only on the tip ends may be cut out entirely if there is plenty of flower buds elsewhere, because peaches in such locations are not as apt to mature in as perfect a condition as those on shorter stiffer growths. In fact, practically every twig that is expected to bear is cut back more or less while nearly every one that will not bear is removed entirely.

The peach tree is kept extremely low, flat, and wide by continually heading back those growths that extend upward. This allows most of the work to be done from the ground. The center is kept quite open, which allows the entrance of plenty of light.

It is easy to renew the top of a peach tree. As it sprouts readily it may often be cut back heavily with full expectation that plenty of new wood will be produced. If a tree for some reason fails to have a crop upon it, the grower knows that no wood at that time on the tree will ever bear, the fruiting wood for the next year being at that time in its growth. Therefore, he can prune away the old wood and produce new in its place without losing a single crop. Sometimes, the main branches are cut back to short stubs and unless the vigor of the tree is almost completely lost, the tree does not suffer appreciably from the operation.

PRUNING THE CHERRY

One-year-old cherries are for the most part the best ones to plant. These are headed back, depending upon the desire of the grower, to from 30 to 40 inches.

As in the case of the apple, the young tree is trained so that the main scaffold limbs will have a fair space between them. As the sour cherry is a comparatively small grower, as great a distance between the limbs is not as necessary as in the apple. Five or six main branches are left. The sweet cherry should have its branches well separated and four or five of them is about the right number.

The pruning of the tree is not severe or difficult. It should consist of just enough to keep the main branches growing in the desired direction. Two or three are chosen each year from those developing from the limbs of the previous season's growth. Only enough thinning of twigs is done to allow the twigs and branches chosen as the main structural ones to become dominant and to prevent crowding. The sweet cherry while young will need some heading-in of the long growing twigs.

There seems to be an impression that the sour cherry should not be pruned, even after it begins to bear. It does, however, as will be quickly evident upon observing the condition in a tree that has been allowed to grow freely and naturally. The smaller twigs in the center of the tree are invariably dead or spindly; those in the crowded outer edge are often several feet long without a healthy bud or spur, except on the extreme end. This condition is simply the result of a lack of sufficient light. Therefore, it is apparent that a system of thinning should be practised sufficient to allow the sun's rays to penetrate to the interior of the tree. As in all trees the leaves must have light in order to grow and to work and develop food for the production of wood and buds. The cherry bears from lateral buds on the previous year's twigs and upon spurs on older wood. It is possible then to have fruit through all the tree and a system of pruning that induces the inside of the tree to produce as well as the outside is the sensible one.

The cherry tree which goes untrained will tend also to shoot up too high for economical work. This must be corrected as in other trees by cutting back to branches which carry the growth outward instead of upward.

PRUNING THE PLUM

The directions for pruning the cherry will apply very closely to the plum. The pruner must realize that they have slightly different tendencies of growth and must govern his cutting accordingly.

TIME TO PRUNE

The usual time to prune is during the dormant season, between the falling of the leaves in autumn and the opening of the buds in spring. Probably February and March are the best months, because the wounds are then exposed to the elements but a short time before they begin to heal. Some people are averse to pruning wood that is frozen, but most practical growers pay no attention to it.

June pruning is advocated by many, the claim being that the tree begins to heal the wound immediately and as it is growing rapidly at that time, covers it quickly. Summer pruning, however, especially heavy summer pruning, may result disastrously to a tree when practised by even an experienced man. So that any possible advantages of June pruning coming for the above reasons are more than offset by the probable disadvantages.

Taking all factors into consideration the time to prune is in the winter or early spring whenever it suits best the grower's convenience.

EFFECTS OF PRUNING

Pruning may affect the health of the tree not only generally, but specifically. It may be the means of increasing the attacks of insects and disease or of lessening this injury. It becomes in some cases the fruit grower's only defense against certain troubles.

Careless pruning may be responsible for the entrance of various pests into the tree. This generally follows the making of wounds that are not covered with some protective material or of wounds that are too large or because a stub was left. In all cases whether the tree be old or young or the wounds large or small, the cut should be made flush with the wood that remains. If it happens to be a twig that is being pruned, the cut should be just above a bud, but close to it. No semblance of a stub should be left. These stubs have no foliage to draw the sap and they gradually dry up and die, leaving an excellent place for the entrance of insects and especially of diseases.

Pruning may rid a tree of certain insects. When the scale insects have become numerous enough almost to kill twigs and branches, they can be controlled often by cutting them away more easily than by spraying. Some caterpillars feed in colonies and when they are found on a small branch it is a wise plan in many cases to cut away the wood upon which they are feeding. Aphis eggs on small trees can be very easily removed when the trees are being pruned. Trees are often troubled with cankers of various kinds such as the blister canker and the cankers of the black rot, bitter rot, Arkansas blotch and fire blight. Removal is the best means of control for these diseases, the canker being cut away to healthy wood and bark. The black knot of the plum and cherry is another disease best controlled by pruning.

Wounds of any considerable size should be covered with some adhesive material. Wounds from three-quarters of an inch and up can usually be coated to advantage with paint, grafting wax, gas tar and certain proprietary compounds. Ordinary lead paint is found on most farms, is effective and easy to apply and is used by most men.

When a regular schedule of fungicidal sprays are applied, it is probably not necessary to cover ordinary sized wounds.

PRUNING TOOLS

A large variety of pruning tools is not necessary. A few, if they are good and of the proper kind are of more value. Poor pruning is naturally the result when poor tools are used.

A good pruning saw is always essential. The two-edged saw that was in common use a few years ago and which is still seen did about as much injury as benefit to a tree, owing to the fact that it was often impossible to make a close cut when there was a sharp angle to work in and because it would often cut with both sides at the same time and then make an additional and unnecessary wound. An ax can never take properly the place of a good saw. It is an abomination in the orchard and tends to much careless and injurious work. The saw which is found now in the best orchards is one made especially for the pruning of trees. It has an arched frame similar to that of a meat saw. The blade is narrow, about 14 inches long, as a rule, and will turn at any angle. This swivel action will allow the operator to cut in any direction, irrespective of the position of the frame, and he can thus get into tight crotches and make a smooth clean cut that does not leave any stub. Owing to the narrowness of the blade, there is little friction and therefore the saw will cut easily and quickly. The saw is not expensive. It will repay its price many times, not only by doing better work than any other saw, but also saving time. It is a good plan too, to have a regular carpenter's saw for use in cutting large limbs, four or more inches in diameter.

Next to a good saw, a person should have a pair of hand pruning shears. These should be strong and otherwise of good quality, as poor shears give no length of service and are apt to do poor work. Another pair of shears with handles about two feet long can be used to advantage in cutting off watersprouts, suckers and some of the more distant twigs. A twelve-foot pole pruner is also good in heading back the smaller branches and twigs that cannot be reached with the other tools. It increases the amount of work that can be done from the ground.